

at least one transducer disposed between said different locations to measure a vibrational parameter indicating a variation of said modal shape.

12. (New) A sensor, comprising:

a mechanical resonator comprising two beams, a yoke rigidly connecting said beams at a first location so that said beams are mutually clamped at said first location, and a connecting element connecting the beams at a second location spaced from the first location along the beams, said connecting element having a stiffness that at least partially determines a modal shape of resonant vibration of the beams; and

at least one transducer, disposed adjacent one of the beams at a location between said first and second locations, and being disposed to sense a vibrational parameter that indicates a variation of said modal shape.

13. (New) A sensor as set forth in claim 12, wherein said connecting element provides a clamped connection of said beams at said second location, and wherein said at least one transducer senses a variation of said modal shape from a clamped-clamped shape to a clamped-pinned shape.

14. (New) A sensor as set forth in claim 12, wherein said connecting element provides a pinned connection between said beams at said second location, and wherein said at least one transducer senses a variation of the modal shape from a clamped-pinned condition to a clamped-free condition.

15. (New) A sensor, comprising:

a mechanical resonator comprising two parallel beams;

a yoke connecting said beams together at a first discrete location;

a box section connecting said beams together at a second discrete location spaced apart from said first discrete location, said box section including first and second spaced connecting elements which connect the beams together, said connecting elements having stiffnesses that at least partly determine a modal shape of resonant vibration of the resonator; and

at least one transducer disposed between the first and second locations to measure a vibrational parameter that indicates variation of said modal shape.

16. (New) A sensor, comprising:

a mechanical resonator comprising two distinct beams, a first connecting element connecting the beams together at a first location, and a second connecting element connecting the beams together at a second location spaced apart along the length of the beams from the first location, where said second element has a stiffness at least partially determining a modal shape of resonant vibration of the resonator;

a first transducer located adjacent a node of said resonant vibration; and

at least a second transducer disposed at a discrete location spaced apart from said first transducer to measure a vibrational parameter indicating variation of the modal shape of vibration.

17. (New) A sensor as set forth in claim 16, wherein said second element comprises a box section comprising two spatially separated members each connecting said beams.

18. (New) A sensor, comprising:  
a mechanical resonator comprising two beams having a mode of vibration with two distinct spaced apart nodes, the beams being connected in the vicinity of each of said nodes by a respective connecting element of which the stiffness at least partially determines a modal shape of resonant vibration of the resonator; and

at least one transducer coupled to one of the beams and providing a measure of a parameter of said modal shape.

19. (New) A sensor as set forth in claim 18, further comprising a second transducer coupled to said resonator in the vicinity of one of said nodes.

20. (New) A sensor, comprising:

a mechanical resonator comprising two parallel beams and at least two connecting elements connecting the beams together at different, spaced-apart, locations, at least one of said connecting elements having a stiffness determining a modal shape of resonant vibration of the resonator;

at least one transducer disposed between said locations to measure a vibrational parameter that indicates variation of said modal shape; and

a housing for the resonator, said housing providing a sealed enclosure for one of the elements and a second one of the elements being disposed outside the housing.

21 (New) A method of sensing, comprising:

deploying a sensor comprising a mechanical resonator comprising two parallel beams and at least two connecting elements which connect the beams together at different, spaced-apart, locations, at least one of said connecting elements having a stiffness which determines a modal shape of resonant vibration of the resonator, and at least one transducer disposed to provide a vibrational parameter which indicates a variation of said modal shape;

exposing one of said connecting elements to an environment which physically alters one of said connecting elements so as to alter its stiffness; and

monitoring a change in said modal shape.--